



## Why Modular?

### Investment Protection

Critical components of the Cisco® Catalyst® 4500 E-Series Switch are upgradability and field replaceability, including line cards, supervisor engines, power supplies, and fans. In addition, forward and backward compatibility of supervisor engines and line cards reduce capital expenses and lower the overall cost of ownership. For example, Cisco Catalyst 4000 Series line cards shipped in 1999 are compatible with the Cisco Catalyst 4500 E-Series Supervisor Engine 6-E today and can enable all the advanced features it has to offer.

### Minimized Network Disruption

Redundant power supplies, supervisor engines, and fans combined with functionally transparent line cards and Nonstop Forwarding with Stateful Switchover create a solid foundation to build a mission-critical network. To minimize network disruptions, full-image In-Service Software Upgrade (ISSU) allows customers to upgrade or downgrade complete Cisco IOS® Software images\* for new line cards, power supplies, features, or bug fixes with minimal effect on the network.

### Network Security

The Supervisor Engine 6-E and Cisco IOS Software provide advanced detection and mitigation of Layer 2 and Layer 3 network attacks with no degradation in switching performance.

### Scalability

Up to 250 Mpps non-blocking performance independent of the number of security policies or Layer 3 or Layer 4 services (up to 128K entries) enabled.

### Unified Communications

Advanced Quality of Service (QoS) with 8\* queues per port, low latency, large buffers, and the ability to scale up to 384 10/100/1000 Power over Ethernet (PoE) ports within a single chassis optimize the E-Series for convergence.



**Table 1. Cisco Catalyst 4500 E-Series Switch Product Line**

Chassis	Supervisor Engine Slots	Line-Card Slots	Maximum Ports
Cisco Catalyst 4503-E	1	2	116
Cisco Catalyst 4506-E	1	5	242
Cisco Catalyst 4507R-E	2	5	244
Cisco Catalyst 4510R-E	2	8	388

### Cisco Catalyst 4500 Supervisor Engines

- **Supervisor Engine 6-E:** CenterFlex enabled supporting 320 Gbps, 250 Mpps performance capacity. Up to 384 ports in the Cisco Catalyst 4510R-E includes larger TCAM resources for high feature capacity and 8\* queues per port. Support for IPv6 in hardware. E-Series and classic line-card support.
- **Cisco Catalyst 4500 Series Supervisor Engine V-10GE:** Includes 10 Gigabit Ethernet uplinks and built-in enhanced NetFlow. Supports up to 388 ports in the Cisco Catalyst 4510R-E chassis. Classic line-card support only.
- **Cisco Catalyst 4000/4500 Supervisor Engine V:** Gigabit uplinks with optional NetFlow and support for 342 ports in the Cisco Catalyst 4510R-E chassis. Classic line cards only.
- **Cisco Catalyst 4000/4500 Supervisor Engine IV:** For medium wiring closets and Layer 3 networks. Provides optional NetFlow and enhanced Layer 3 routing Supported in the 3-E, 6-E, and 7R-E slot chassis. Classic line cards only.

- **Supervisor Engine II-Plus 10 GE:** Includes two 10 Gigabit Ethernet uplinks and four Gigabit Ethernet Small Form-Factor Pluggable (SFP) uplinks for high-performance enterprise access and Metro Ethernet. Supported in the 3-E, 6-E, and 7R-E slot chassis. Classic line cards only.
- **Cisco Catalyst 4500 Series Supervisor Engine II-Plus and Cisco Catalyst 4500 Series Supervisor Engine II-Plus-TS:** Provides enhanced Layer 2 features at an entry-level price; designed for small Layer 2 wiring closets and provides QoS and security features. Classic line cards only.



**Table 2. Cisco Catalyst 4500 Supervisor Engine Comparison**

Capabilities	Supervisor Engine II-Plus	Supervisor Engine V-10GE	Supervisor Engine 6-E
Capacity	64 Gbps	136 Gbps	320 Gbps
Bandwidth per Slot	6 Gbps	6 Gbps	24 Gbps
IPv4, IPv6 Throughput	48 Mpps, 30 Kpps	102 Mpps, 30 Kpps	250 Mpps, 125 Mpps
Software Support	IP Base only	IP Base and Enterprise Services	IP Base and Enterprise Services
Queues per Port	4	4	8*
IPv4 Route Entries	32K	128K	256K

\* Available Q1CY 08



## Line Cards

- **10 Gigabit Ethernet:** The 6-port E-Series 10 Gigabit Ethernet card (2.5:1 oversubscribed) provides enterprise distribution and small and medium-sized business (SMB) core connectivity. Available with X2 optics or TwinGig Converter modules for use with SFP optics.
- **Gigabit Ethernet Fiber:** Gigabit Ethernet fiber cards provide high-performance Gigabit Ethernet uplinks, enterprise distribution, and SMB core connectivity. Available in a variety of port counts and optical types (gigabit interface converter [GBIC] and SFP optics).
- **Gigabit Ethernet copper:** Available in 48-port E-Series with PoE and Premium PoE. Also available in classic versions with and without PoE in 24 and 48 port versions.
- **Fast Ethernet fiber:** Support for multimode and single-mode fiber and for FX, LX, and BX transceivers.
- **Fast Ethernet copper:** Fast Ethernet line cards are available in either 24- or 48-port counts with optional PoE.

## Centralized Architecture with CenterFlex Technology

Innovations enabled by the application-specific integrated circuits (ASICs) in the Supervisor Engine 6-E deliver industry-leading centralized performance and flexibility. The centralized architecture helps ensure consistent high performance while protecting the customer's investment in line cards. The Cisco Catalyst 4500 E-Series supports line cards introduced as early as 1999. CenterFlex technology on the Supervisor Engine 6-E is enabled by custom-designed ASICs and ternary content addressable memory (TCAM), which are crucial to feature-rich and configuration-flexible line-rate performance. The Supervisor Engine 6-E uses fourth

generation TCAMs to process Layer 3 routing independently from wire-speed intelligent services such as QoS and security. The architecture is designed so that each function and feature has a large amount of dedicated TCAM space, helping ensure high performance.

## Cisco Catalyst 4500 E-Series Benefits

- **High performance:** Predictable high performance (IPv4/IPv6) with concurrently enabled services (QoS, security, multicast, and more).
- **Increased control and flexibility:** Optimize performance of voice, video, and data application over a unified network.
- **High Availability and security:** Minimize planned and unplanned downtime delivering business-critical applications securely and uninterrupted.
- **Service Capacity:** Ample resources to enable new services today and in the future.
- **IPv4 to IPv6 migration:** Optimized to enable IPv4 and IPv6 simultaneously, providing for a smooth migration.
- **Superior investment protection:** Maximum backward and forward compatibility. Mix and match new and classic line cards without performance degradation.